REMARKS

This is in response to the Office Action mailed June 29, 2009. All rejections are respectfully traversed. Claims 1-15 are pending in the application.

Rejections Under 35 U.S.C. §103

The Examiner rejected claims 1-6, and 14-15 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,301,756 to Relyea et al. (hereinafter "Relyea") in view of U.S. Patent No. 5,921,472 to Haruch et al. ("Haruch"). Claim 1 which is representative in part of each of the rejected claims recites:

> 1. A method for fire-fighting, the method comprising:
> piercing a shell of a burning object by pushing at least one elongated piercing tool arranged in a rescue boom from the side of a first surface of the shell to the side of a second surface thereof,
> feeding, along at least one longitudinal channel in the piercing tool, a fire extinguishing medium to a nozzle provided in the piercing tool,
> spraying the fire extinguishing medium to the side of the second surface of the shell through a plurality of orifices provided in the nozzle,
> and directing a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape.

The Examiner admitted that "Relyea et al. does not teach directing a plurality of single jets expelled from the orifices so that they intersect one another to form a single jet having a flat curtain-like shape." Office Action, page 3, lines 4 – 6. However, the Examiner erroneously asserted that "Haruch et al. does teach directing a plurality of single jets expelled from the orifices so that they intersect one another (Fig. 1, 25) to form a single uniform jet having a flat curtain like shape (col 1, lines 22 – 23). Office Action, page 3, lines 7 – 9.

Applicant respectfully submits that, contrary to the Examiner's characterization, col. 1, lines 22 -23 of Haruch describe a nozzle disclosed in U.S. Patent No. 5,306,418 to Dou et al. (hereinafter "Dou") which Haruch incorporates by reference. The cited portion of Haruch recites "[i]n the apparatus of the Dou et al [sic] patent, the preferred discharge nozzle has a generally

hemispherical discharge end which is formed with a single elongated slot-like orifice adapted to produce a flat fan-shaped spray." Col. 1, lines 19 – 24, emphasis added. Applicant submits that the single elongated slot of Dou does not teach or suggest anything about "a plurality of single jets" and in fact teaches away from using "a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape" as particularly claimed.

Applicant further respectfully submits that, contrary to the Examiner's characterization, Fig. 1, item 25 of Haruch does not teach or suggest "a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape" as claimed. Rather, Haruch recites:

> "In accordance with the present invention, the discharge end 22 of the nozzle 20 is formed with a plurality of discharge orifices 25 which are located on opposite sides of the axis of the nozzle and which are elongated in a direction extending transversely of the axis. By virtue of the discharge end of the nozzle having a plurality of outlet orifices, the mixture discharged from the nozzle is atomized more finely than is the case of a nozzle having a single discharge orifice of comparable area centered on the axis of the nozzle. As a result of the finer atomization effected by the multiple orifices, the efficiency of the apparatus 10 is increased in that a given volume of liquid may be broken into particles having a relatively high surface area even though steam is supplied to the apparatus at a comparatively low volumetric flow rate.
>
> In the embodiment of FIGS. 1 and 2, two elongated outlet orifices 25 are formed in the discharge end 22 of the nozzle 20. The orifices are located on opposite sides of and are spaced equidistantly from the axis of the nozzle and, as pointed out above, are elongated in a direction extending transversely of the nozzle. FIGS. 1 and 2 represent one embodiment in which, the orifices 25 are angled toward one another so as to cause the streams sprayed from the nozzle to converge upon progressing away from the discharge end of the nozzle. In this way, the streams impact against one another to effect still further atomization immediately outside the nozzle. Each orifice preferably is inclined at an angle up to about ten degrees relative to the axis of the nozzle." Col. 3, lines 6 – 36, emphasis added.

Thus, Haruch is directed to increasing the efficiency of atomizing a liquid flow, and does teach or suggest forming a single uniform jet having a flat curtain like shape. Further, Applicant

submits that because discharge orifices 25 of Haruch are elongated, the discharge streams emitted therefrom are not in the form of jets as particularly claimed.

The Examiner cited col. 3, lines 15 – 20 to assert that a motivation to combine Relyea Haruch would be "to increase the efficiency of the apparatus." Office Action, page 3, line 12. Applicant respectfully submits that the recited increased efficiency has nothing to do with "a method of firefighting" as claimed and would not increase the efficiency of firefighting. Rather the cited portion of Haruch recites "[a]s a result of the finer atomization, effected by the multiple orifices, the efficiency of the apparatus 10 is increased in that a given volume of liquid may be broken into particles having a relatively high surface area even though steam is supplied to the apparatus at a comparatively low volumetric flow rate." Col. 3, lines 15 – 20. While this may increase efficiency for use in Haruch's field of "fluidized catalytic cracking" Applicant submits that increasing atomization of a liquid flow would not increase efficiency for the purpose of firefighting.

For at least the reason that no combination of Haruch and Relyea teaches or suggests "directing a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape" as particularly claimed, Applicant respectfully submits that the rejections of claims 1-6, and 14-15 under 35 U.S.C. §103(a) are improper and should be withdrawn.

Applicant further submits that the rejections of claims 1-6, and 14-15 under 35 U.S.C. §103(a) are improper because Haruch is in the field of "fluidized catalytic cracking" which is not analogous to the field of firefighting. Nothing in Haruch suggests anything that might be beneficial to firefighting and persons having ordinary skill in the art would not look to Haruch or any other disclosure in the field of fluidized catalytic cracking in order to develop a method of firefighting. Additionally, persons having ordinary skill in the art would not be motivated to combine Haruch with Relyea because Haruch relates to atomization of liquid hydrocarbon in catalytic cracking. (see Abstract). Since it is widely know that atomized liquid hydrocarbons are highly flammable, Haruch is non-analogous art which would not be considered by those in the field of firefighting. Reconsideration is respectfully requested.

The Examiner rejected claims 7-10 under 35 U.S.C. §103 over Relyea in view of U.S. Patent No. 3,913,845 to Tsuji (hereinafter "Tsuji") and further in view of Haruch. Tsuji discloses "[a] fuel injection nozzle is disclosed in which a plurality of orifices or nozzle holes are formed through a nozzle head in such a way that the angles of spray are increased stepwise as the orifices are farther located from the center of the nozzle tip. The orifices may be arrayed in row or column or along one or a plurality of coaxial circles. The fuel-air or steam mixtures injected through the orifices will not interfere with each other so that a large number of independent small flames may be formed." Abstract, emphasis added.

Applicant respectfully submits that Tsuji does not cure the deficiencies of Relyea and Haruch cited above with respect to the rejections of claims 1-6, and 14-15 under 35 U.S.C. §103(a) by teaching or suggesting "directing a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape" as particularly claimed. Further, because Tsuji recites that "[t]he fuel-air or steam mixtures injected through the orifices will not interfere with each other" (Abstract), this combination also teaches away from Applicant's invention in which a plurality of single jets are combined (i.e., interfere with each other) to form a single uniform jet.

For at least the reason that no combination of Relyea, Haruch and Tsuji teaches or suggests each and every element of claims 7 – 10, Applicant respectfully submits that the rejections of claims 7 – 10 under 35 U.S.C. §103 are improper and should be withdrawn. Reconsideration is respectfully requested.

The Examiner rejected claim 11 under 35 U.S.C. §103(a) over Relyea in view of Tsuji and Haruch and U.S. Patent No. 2,246,797 to Geddes et al. (hereinafter "Geddes") and rejected claims 12 – 13 under 35 U.S.C. §103(a) over Relyea in view of Tsuji, Haruch, Geddes and U.S. Patent No. 4,435,891 to Nicholson et al. (hereinafter "Nicholson").

Geddes describes a breaching nozzle for fire hose "whereby effective streams of water may almost instantaneously be introduced into the interior spaces of building structures to combat fires therein." Col. 1, lines 2 – 6. Nicholson describes a fan spray nozzle machined in a wall of the water header to generate a desirable spray pattern. Col. 1, lines 29 – 31. Applicant respectfully submits that neither Geddes nor Nicholson cure the deficiencies of Relyea, Haruch

and Tsuji described above by teaching or suggesting " a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape" as claimed.

For at least the reason that no combination of Relyea, Tsuji, Haruch, Geddes and/or Nicholson teaches or suggests each and every element of claims 11, 12 or 13, Applicant respectfully submits that the rejections of claims 11 – 13 under 35 U.S.C. §103 are improper and should be withdrawn.

Further, Applicant respectfully submits that Nicholson relates to the field of spray nozzles used in conjunction with a pipe or tube that serves as a water header, wherein "[t]he nozzle provided herein has potential utility within a cheese filter, but other uses are also contemplated." Col. 1, lines 9 – 11 and 33 – 35. Applicant submits that Nicholson's device with utility in food processing is non-analogous art with respect to the instant field of firefighting nozzles. Persons having ordinary skill in the art of firefighting would not be motivated to look to the field of food processing to develop a nozzle which would provide a uniform jet having flat curtain like shape as claimed which is particularly designed for firefighting. Reconsideration is respectfully requested.

CONCLUSION

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below. The Examiner is invited and encouraged to telephone the undersigned with any concerns in furtherance of the prosecution of the present application.

Please charge any deficiency as well as any other fee(s) which may become due at any time during the pendency of this application, or credit any overpayment of such fee(s) to Deposit Account No. 50-2896. Also, in the even any extensions of time for responding are required for the pending application(s), please treat this paper as a petition to extend the time as required and charge Deposit Account No. 50-2896 therefore.

Respectfully submitted,

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Dated:

Joseph P. Quinn, Reg. No. 45,029
Customer No. 71130
Attorney for Applicant(s)
SEYFARTH SHAW LLP
World Trade Center East
Two Seaport Lane, Suite 300
Boston, MA 02210
Tel: 617-946-4833
Fax: 617 946-4801
E-mail: bosippto@seyfarth.com